

IN THE CLAIMS

Claim 1 (currently amended): Contact element for supplying electric current to substantially board-shaped objects that are to be treated in an electrolytic process, the board-shaped objects each having an electrically conductive surface, the contact element comprising:

~~wherein the contact element (15, 16) has one or more contact areas (26) at least one contact area, the shape of the contact areas being~~ said at least one contact area having a shape configured in such a way that no damages occur in the areas of the electrically conductive surface adjacent to ~~the contact areas~~ said at least one contact area when large currents are transmitted from ~~the contact elements (15,16)~~ said contact element to the electrically conductive surface through said at least one contact area placed in contact with the electrically conductive surface, printed on the contact areas on the electrically conductive surface of printed board material (L), to the conductive surface, the contact areas (26) said at least one contact area being limited by boundary lines (34), the shape of said ~~contact areas~~ at least one contact area being designed in such a way that the ratio V of the square of the overall length L of ~~all~~ said boundary lines (34) to the size F of ~~all the contact areas (26)~~ said at least one contact area as given by the expression:

$$V = \frac{L^2}{F}$$

is at least 25 and ~~wherein the side faces of the contact element adjacent to the contact areas are exposed for cooling in such a way that the liquid for treatment may wash them.~~

Claim 2 (currently amended): Contact element according to claim 1, wherein the contact element (15,16) is provided with at least two humps (24) which are separated by intervals (25) and which have one contact area (26) each, said contact areas (26) lying substantially in one plane and being arranged in such a manner that electrical contact can be made among all the contact areas (26) and their corresponding contacting areas on the objects (L).

Claim 3 (currently amended): Contact element according to claim 2, wherein the humps (24) have a ~~section which is essentially circular and parallel to the plane in which the contact areas (26) are lying~~ toothed outside surface.

Claim 4 (currently amended): Contact element according to one of the claims 2 and 3, wherein the number of humps (24) is even, the humps (24) being arranged in rows.

Claim 5 (currently amended): Contact element according to claim 4, wherein four humps (24) are provided and arranged in such a way that the respective contact areas (26) are arranged at the corners of a square, a parallelogram or a trapezoid.

Claim 6 (currently amended): Contact element according to claim 2, wherein at least one of said intervals ~~interval (25)~~ is provided which is shaped like a groove.

Claim 7 (canceled).

Claim 8 (currently amended): Contact element according to claim ~~[[7]]~~ 16, wherein two grooves ~~(25)~~ are provided which are arranged perpendicularly to one another and which subdivide the circular surface into four equally sized contact areas ~~(26)~~ having the shape of a segment of a circle.

Claim 9 (currently amended): Contact element according to claim 1, wherein ~~the contact element (15,16) is provided with at least one contact area (26)~~, said at least one contact area ~~(26) being~~ is star-shaped, trifoliate or dumbbell-shaped.

Claim 10 (currently amended): Contact element according to one of the previous claims 1-3, 6 and ~~[[6-]]~~9, wherein the contact element is preferably made from titanium, niobium, tantalum or from alloys of these metals or of other metals.

Claim 11 (currently amended): Contact element according to one of the previous claims 1-3, 6 and ~~[[6-]]~~9, wherein the contact areas ~~(26)~~ are substantially made of copper.

Claim 12 (currently amended): Contact element according to one of the previous claims 1-3, 6 and ~~[[6-]]~~9, wherein the contact areas ~~(26)~~ are coated with an electrically conductive, chemically resistant coating of gold, platinum, iridium, ruthenium, rhodium, alloys of these metals or mixed oxides.

Claim 13 (currently amended): Contact organ for supplying electric current to substantially board-shaped objects that are to be treated by an electrolytic process, the board-shaped objects each having an electrically conductive surface, the contact organ comprising:

~~provided with at least one stem; and with~~

at least one contact element, the said at least one contact element being arranged at one end of the said stem, the said stem being movable with the said contact element by way of a restoring force in such a way that the said contact element can be ~~printed~~ pressed onto the electrically conductive surface of the board-shaped objects,

wherein the said contact element (15, 16) has one or more contact areas (26), the shape of the contact areas being configured in such a way that no damages occur in the areas of the electrically conductive surface adjacent to the contact areas when large currents are transmitted from the said contact element ~~elements (15, 16) printed on the contact areas on the electrically conductive surface of printed board material (L) [[,]]~~ to the electrically conductive surface through said contact areas placed in contact with the electrically conductive surface, the contact element (15, 16) being provided with each of said contact areas (26) ~~which are being~~ limited by boundary lines (34), the shape of at least one of said contact areas being designed in such a way that the ratio V of the square of the overall length L of ~~all~~ the boundary lines (34) of said at least one of said contact areas to the size F of ~~all the contact areas (26) said at least one of said~~ contact areas as given by the expression:

$$V = \frac{L^2}{F}$$

is at least 25 and ~~wherein the side faces of the contact element adjacent to the contact areas are exposed for cooling in such a way that the liquid for treatment may wash them.~~

Claim 14 (currently amended): Contact organ according to claim 13, wherein the said at least one contact element ~~(15,16)~~ is provided with at least two humps ~~(24)~~ which are separated by intervals ~~(25)~~ and which have one contact area ~~(26)~~ each, all said contact areas ~~(26)~~ lying substantially in one plane and being arranged in such a manner that electrical contact can be made among all the said contact areas ~~(26)~~ and the electrically conductive surface ~~their corresponding contacting areas on the objects (L)~~ when said at least one contact element is pressed onto the electrically conductive surface.

Claim 15 (currently amended): Method for supplying electric current to substantially board-shaped objects that are to be treated by an electrolytic process, the board-shaped objects each having an electrically conductive surface, the method comprising the steps of:

~~at least one current-carrying contact element being printed on the surface of the objects, thereby generating a flow of current between the contact elements and the objects,~~

providing at least one contact element, wherein the contact element (15,16) has one or more contact areas (26), the shape of the contact areas being configured in such a way that no damages occur in the areas of the electrically conductive surface adjacent to the contact areas when large currents are transmitted from the contact element elements (15,16) printed on the contact areas on the electrically conductive surface of printed board material (L)[[.]] to the electrically conductive surface through the contact areas placed in contact with the electrically conductive surface, each of the contact elements (15,16) being provided with one or more contact areas (26) which are being limited by boundary lines (34), the shape of at least one of said the contact areas being designed in such a way that the ratio V of the square of the overall length L of all the boundary lines (34) of the at least one of the contact areas to the size F of all the contact areas (26) the at least one of the contact areas as given by the expression:

$$V = \frac{L^2}{F}$$

is at least 25 and ~~wherein the side faces of the contact element adjacent to the contact surfaces are exposed for cooling in such a way that the liquid for treatment may wash them~~[[.]];

pressing the at least one contact element on the electrically conductive surface;

and

generating a flow of current between the contact element and the electrically conductive surface.

Claim 16 (new): Contact element for supplying electric current to substantially board-shaped objects that are to be treated in an electrolytic process, the board-shaped objects each having a conductive surface,

wherein the contact element has one or more contact areas, said contact areas having a shape configured in such a way that no damages occur in areas of the conductive surface adjacent to said contact areas when large currents are transmitted from said contact element to the conductive surface through said contact areas placed in contact with the conductive surface, said contact areas being limited by boundary lines, the shape of said contact areas being designed in such a way that the ratio V of the square of the overall length L of all boundary lines to the size F of all the contact areas and given by the expression:

$$V = \frac{L^2}{F}$$

is at least 25 and wherein the side faces of the contact element adjacent to the contact areas are exposed for cooling in such a way that the liquid for treatment may wash them,

wherein several grooves are provided that subdivide a circular surface into several contact areas which have the shape of a segment of a circle, the grooves intersecting the center of the circular surface.